



Moving Beyond Seating-centered Learning Environments: Opportunities and Challenges Identified in a POE of a Campus Library



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ABSTRACT

Colleges increasingly are recognized as student workplaces, inspiring campus leaders to create healthier campus environments. Yet challenging this vision is burgeoning research regarding the health risks of sedentary behavior, an under-studied college health concern that implies deleterious health outcomes and, by extension, academic impediments as well.

Can movement be incorporated into academic activities such as studying or reading? This question—particularly relevant to libraries due to their increasing use as study spaces—requires the expansion of standard methods of evaluating student health needs and behaviors. We propose Post-Occupancy Evaluation (POE) methods as a novel way to investigate sedentary behaviors in a campus library *and* identify designs and practices to help promote movement.

In 2012 and 2013, as part of an undergraduate architecture class, we conducted two POEs of Berkeley's newest library to learn how the space is used and, inspired by new research about the perils of sedentary behavior, we also considered how the library could be used. Through our findings we confirmed the changing role of campus libraries as study spaces, observed social and built environment contexts of sedentary behaviors in library settings, and identified possible interventions to introduce postural variation and physical activity into observed patterns of library use.

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INTRODUCTION

School and college settings increasingly are recognized as the workplace of students (Gardner & Kelly, 2005), inspiring campus leaders across the nation to define and create healthy campuses. This endeavor involves a complex intersection of the body, environment, and health. We see health holistically and define a healthy campus as a place that supports the whole student—a unified bio-psycho-social entity—and actively promotes positive health outcomes.¹ Posing an exceptional challenge to campus health, however, is a burgeoning body of research regarding the health risks of sedentary behavior and physical inactivity that together produce myriad health risks *regardless of physical activity levels* (Dunlop et al., 2014; Hamilton, Healy, Dunstan, Zderic, & Owen, 2008; Saunders, 2011; Tremblay, Colley, Saunders, Healy, & Owen, 2010). As de facto centers of student life and quintessential places of sitting, academic libraries are uniquely suited to participate in the creation of healthy campus environments.

In this paper we employ Post-Occupancy Evaluation (POE) methods as a means of evaluating student uses and perceptions of UC Berkeley's newest library and propose another use of POE as well: a novel way to investigate sedentary behaviors and, in so doing, illuminate possible designs and practices that can help to simultaneously reduce sedentary behaviors *and* promote physical activity. Thus, we present here an initial, exploratory study employing POE methods to understand the social and built environment contexts of students' study-related behaviors and, in response, identify practical solutions that simultaneously support observed use and introduce opportunities for healthy postures and activities in library (and other campus) settings.

INTRODUCTION TO POST-OCCUPANCY EVALUATION METHODS

Post-Occupancy Evaluation, a field of study that arose in the 1960s from an "extraordinary confluence of interests among social scientists, designers, and planners" (Zimring, 2001, p. 306) has been defined as:

The *systematic* assessment of the process of delivering buildings or other designed settings or the *performance* of those settings as they are actually used, or both, as compared to a set of *implicit or explicit standards*, with the intention of *improving* process or settings [emphasis in original]. (Zimring, 2001, p. 317)

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¹ The 1948 World Health Organization constitution offers this definition of health: "a state of complete physical, social and mental well-being, and not merely the absence of disease or infirmity" (in Nutbeam, 1998).

Said another way, Post-Occupancy Evaluation is the study of buildings *in use*—after they have been completed and occupied—and an important aspect of the field of environment-behavior research that helps to illuminate the experience of the non-paying client (building user) and offer insight to inform policy, design, and program changes at the site and other similar buildings (Zeisel, 1975; Zimring, 2001). As a general type of study, POEs can focus on assessing the stated goals of the building as compared to its actual performance and use, evaluate services and advise on new (see for example Cranz, 2013), and investigate user perceptions of building design and programming. In so doing, POEs can support organizational learning (Zimring, 2001) and provide accountability with public projects (Cranz, 2013; Lushington & Kusak, 1991). Further, POEs are useful to address a number of concerns—such as design, maintenance, user experience, and policy—from a variety of perspectives, including users (Cranz & Cha, 2006), staff (Schneekloth & Keable, 1991), or both (Cranz, Taylor, & Broudehoux, 1997).

Cranz (2013) argues that libraries in particular are rich sites for POE studies due to the many constituencies they contain and many publics they serve. Summarizing the collective value of POE research conducted in libraries, Cranz writes:

In general we can conclude that library POEs have been useful for helping planners and designers create good user experiences and functional libraries. Collectively, they have highlighted wayfinding, user preference for choice in seating, staff workflow, and the importance of flexibility for continuous growth and changes in library materials and technology. (p. 78)

Thus, POE research can be helpful to library design, space planning, and administration in two ways. First, the collective findings of previous studies can help provide general clues into common issues, needs, and experiences, and thus provide important, evidence-based insight to design, program, and policy issues that can inform other projects. Second, Post-Occupancy Evaluation studies are an essential component of organizational learning and “fine-tuning” of the building (Zimring, 2001) to assess and make changes to a building once it has been completed and occupied.

In this way, in POE research, the objectives of new buildings “can be treated as hypotheses to be tested once the building is complete and by studying how the users occupy the space” (Cranz et al., 1997, p. 39). Yet our study, presented below, differs in an important way: we utilized not only the stated goals and objectives of the building as hypotheses, but also burgeoning research in student health and sedentary physiology as inspiration—and justification—for our study.

HEALTH IMPLICATIONS OF SEDENTARY STUDENT BEHAVIOR

Saunders (2011), citing recent studies linking prolonged sitting to changes in skeletal muscle, blood cholesterol, and lipid and glucose levels, argues that sedentary behavior—even a few hours at a time—poses a health risk greater than that of smoking, obesity, and old age. More alarmingly, the mortality risk linked to sedentary behavior is not ameliorated or offset by exercise; in other words, meeting recommended exercise levels—or even increasing “leisure time” physical activity levels—is unlikely to prevent obesity and other deleterious health outcomes in an otherwise sedentary lifestyle (Chastin & Skelton, 2012; Owen, Bauman, & Brown, 2009). College students, who spend an estimated 30+ hours per week engaged in sedentary behaviors (Buckworth & Nigg, 2010),² are not immune to these risks. Obesity among college students is on the rise—in fact, one study of University of New Hampshire students found that 47% of college males met the criteria for obesity in 2011—and the sedentary student lifestyle increases college students’ risk for developing cardiovascular disease and diabetes mellitus

² Or more, as suggested by a pair of informal sitting-logs we distributed sitting logs in two architecture courses at UC Berkeley (Fall 2012 and Fall 2013).



Image 1. Why do academic activities assume the use of a chair? (Image credit: Caitlin DeClercq).

(Morrell, Lofgren, Burke, & Reilly, 2012). These findings call into question typical conceptions of health promotion and implore us to reconsider our designs for campus health; in particular, we cannot take the sedentary norm of academic environments for granted.

Thus, the implication is clear: we must shift the focus of our health promotion efforts to the reduction of sedentary hours and aim our interventions at the environments in which we spend the majority of our waking hours sitting down: at work and school.

RETHINKING SEDENTARY LEARNING ENVIRONMENTS

The common, unquestioned assumption that academic activities are sedentary (see Buckworth & Nigg, 2010) can be read in the built environment: even a casual observer will notice that classrooms, libraries, cafes, and common areas are filled with chairs and benches (Image 1). Such sitting-centered environments undoubtedly contribute to long hours of sedentary behaviors and may play a larger role in the transition between active childhoods and sedentary adulthood (Dunlop et al., 2014; Gordon-Larsen, The, & Adair, 2010). Further, the sitting posture itself is fraught with health concerns: ergonomic and somatic disciplines have long presented evidence of the ways in which chair-sitting contributes to back, neck, and eye problems (Cranz, 2000; Mandal, 1997).

Students are particularly susceptible to these ailments due to prolonged exposure to standardized school furniture (Mandal, 1997; Gardner & Kelly, 2005). In fact, 12.5% of college students reported back pain in the Spring 2012 National College Health Assessment Survey (American College Health Association, 2012),³ a concerning statistic given that back pain is linked to truancy, distraction, and reduced motivation and physical activity (Gardner & Kelly, 2005). Further, physical activity is widely seen as a “leisure time” pursuit for college students (see American College Health Association, 2012 and Buckworth & Nigg, 2010), which is assumed to occur in non-academic spaces and thus remain spatially and temporally removed from academic activities.

Despite recent interest in the role of built environment interventions to improve the health of both children and adults (see Dannenberg,

³ Though the cause of the back pain incidence is not specified, evidence from Mandal (1997), Cranz (2000), and Gardner and Kelly (2005) suggests that prolonged exposure to standardized furniture and sedentary behaviors could be a significant contributor to incidence of back pain among students.

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